

REMARKS / ARGUMENTS

Claims 1-3m 6, 9-14 remain pending in this application. Claims 4, 5 and 8 have been canceled without prejudice or disclaimer. New claims 11-14 have been added.

Priority

Applicants appreciate the Examiner's acknowledgment of the claim for priority and safe receipt of the priority document.

Information Disclosure Statement

Applicants acknowledge the Examiner's objection to the listing of references in the specification as not being a proper Information Disclosure Statement. Applicants wish to point out to the Examiner that all of the references cited in the specification have been submitted in a proper Information Disclosure Statement and listed on Form PTO-1449. It is also noted that the Examiner has returned the PTO-1449 Forms to indicate that the references cited therein have been considered.

Drawings

Approval is hereby requested for a proposed drawing correction to Fig. 12(a) in order to label it "Prior Art". A separate letter to the official draftsman is enclosed.

37 CFR §112

Claim 6 has been amended to overcome the outstanding rejection under 35 U.S.C. §112, first paragraph. The claims have been amended to overcome the outstanding rejection under 35 U.S.C. §112, second paragraph. The Examiner is hereby invited to contact the undersigned by telephone with any questions.

37 CFR §§102 and 103

Claims 1 and 5 stand rejected under 35 U.S.C. §102 as being anticipated by Bayer et al. Claims 1, 2, 4, 6, 7 and 9 stand rejected under 35 U.S.C. §103 as being unpatentable over Van der Weide in view of Applicants' Admitted Prior Art. Claim 3 stands rejected under §103 as being unpatentable over Bayer et al in view of Binnig. Claim 8 stands rejected under §103 as being unpatentable over Bayer et al in view of Gueret. Finally, claim 10 stands rejected under §103 as being unpatentable over Maddix in view of Fujiu. These rejections are traversed as follows.

According to the present invention, a probe for scanning probe lithography has a conductive fine needle with increased mechanical strength. The cross-sectional diameter of the conductive fine needle is substantially uniform along its axial direction. Meanwhile, the cross-sectional diameter of an insulator surrounding the conductive fine needle increases in size in the direction extending away from the tip end of the needle. Therefore, the tip of the probe wears due to abrasive contact with the resist film, the cross-sectional configuration of the conductive fine needle at

the tip of the needle remains unchanged, thereby making it possible to keep a substantially constant pattern width (see specification page 3, line 26 to page 4, line 20). Thus, the life span of the probe is maintained even though the needle is worn down through contact with the resist.

On the other hand, Bayer et al disclose a read/write head as opposed to a probe for scanning probe lithography. The read/write head has a strengthening shell on the tip shaft. Referring to Figure 1, Bayer et al disclose that the diameter of shaft 4A is 20nm and that the length of the shaft is 20 μ m. While the diameter of the strengthening shell is not disclosed, in view of the method of fabrication disclosed at column 3, lines 22-39, one having ordinary skill would recognize that it is difficult to produce a sufficiently thick shell given the diameter of shaft 4A. If such a tip is used, it is likely that the shaft will be bent by some angle when the front side tip end 4B comes into contact with the surface of a charged storage device resulting in incorrect positioning of the front side tip end 4B. To overcome this problem, it would appear necessary to the skilled artisan to increase the diameter of the strengthening shell 6. However, in order to accommodate such a thicker shell 6, cantilever 3 would also have to become thicker and would fail to properly function as a spring, as required. As a result, the reference would not be considered as providing a teaching in the scanning probe lithography art.

It is submitted that the pending claims patentably define the present invention over Bayer et al. According to the presently claimed invention, a mechanically strong

tip is provided that is not subject to bending and is attached to a lever spring which can properly function as a spring.

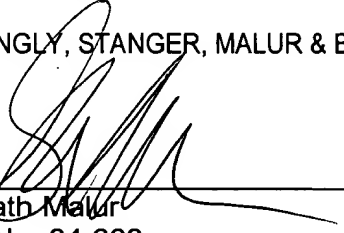
The deficiencies in the primary reference to Bayer et al are not overcome by resort to the secondary references. For example, the electrode of van der Weide is not meant for supplying current. Also, numeral 292 represents a second conductor layer and as such is not combinable with Bayer et al. Binnig et al show in Fig. 1B a needle 15 without a uniform cross-section and a spacer or slider 14. In the present invention, a hemispherical insulator is shown surrounding a needle and having a uniform cross-sectional diameter. Gueret discloses a multiple STM-tip unit, but does not disclose any conductive fine needle as in the presently claimed invention. Finally, Maddix et al disclose the making of an opening, however, that opening is used to form side wall 17 for the probe tip. Finally, neither Maddix et al nor Fujiu et al disclose the conductive fine needle of the present invention.

Conclusion

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.

By 
Shrinath Malur
Reg. No. 34,663
(703) 684-1120

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Response to Notice ... dated November 30, 2005

Reply to Notice of Non-Compliant Amendment dated November 2, 2005

Amendments to the Drawings

Fig. 12 (a) has been labeled "Prior Art".

Attachments: Replacement Sheet